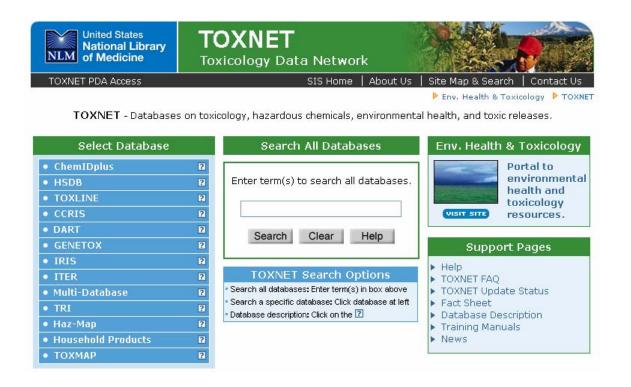


# **TOXNET:**Toxicology & Environmental Information

http://toxnet.nlm.nih.gov/



National Network of Libraries of Medicine, South Central Region Houston Academy of Medicine-Texas Medical Center Library 1133 John Freeman Blvd. Houston, TX 77030

NLM Contract No.: N01-LM-1 -3515

# **TOXNET (TOXicology Data NETwork)**

http://toxnet.nlm.nih.gov/

- A FREE web-based integrated system of toxicology and environmental health databases
- Information on toxicology, environmental health, hazardous chemicals, toxic releases, chemical nomenclature, and specialty areas such as occupational health and consumer products
- A product of NLM's Toxicology and Environmental Health Information Program (TEHIP)

### **Four Types of Databases**

- 1. Toxicology <u>Data</u> Files:
  - a. HSDB
  - b. CCRIS
  - c. GENE-TOX
  - d. IRIS
  - e. ITER
  - f. TRI
- 2. Toxicology Literature Files:
  - a. TOXLINE
  - b. DART
- 3. Chemical Information: ChemIDplus
- 4. Other Databases:
  - a. Haz-Map
  - b. Household Products
  - c. TOXMAP



### **TOXNET Data Files**

### **Hazardous Substances Data Bank (HSDB)**

- From NLM
- About 5000 chemical records
- Toxicology of potentially hazardous chemicals
- Information on human exposure, industrial hygiene, emergency handling procedures, environmental fate and regulatory requirements
- Data from books, government documents, technical reports and selected primary literature. Some data is compiled expressly for HSDB
- Peer reviewed by the Scientific Review Panel

### Chemical Carcinogenesis Research Information System (CCRIS) -

- From the National Cancer Institute (NCI)
- Data and information on carcinogenicity, mutagenicity, tumor promotion, and tumor inhibition test results
- Data derived from studies cited in primary journals, current awareness tools,
   NCI reports, and other special sources
- About 9000 chemical records
- A scientifically evaluated and fully referenced data bank

### **Genetic Toxicology (GENE-TOX)**

- From the U.S. Environmental Protection Agency (EPA)
- Note: GENE-TOX not updated since January 2000
- Mutagenicity studies
- Data Structure assay type, assay code, results, panel report, reference
- 3214 Chemical Records
- Selected literature was reviewed by scientific experts

### **Integrated Risk Information System (IRIS)**

- From the EPA
- Contains EPA consensus scientific positions and quantitative values on cancer and non-cancer health effects that may result from lifetime oral or inhalation exposure to specific chemical substances in the environment
- About 550 chemical records
- Scientifically reviewed by groups of EPA scientists and represent EPA consensus

### **International Toxicity Estimates for Risk Assessment (ITER)**

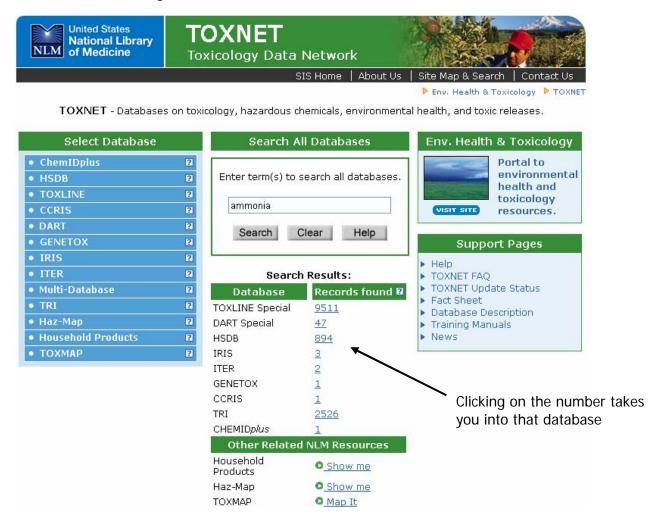
- From Toxicology Excellence for Risk Assessment (TERA), a non-profit corporation
- Provides a comparison of international risk assessment information derived by different organizations (U.S. and International)
- About 650 chemical records
- Includes synopses, links to organization source documents

# **Searching TOXNET**

- Each TOXNET database may be searched individually or by using the Search
   All Databases option (record counts may vary somewhat when databases
   are searched individually)
- The databases employ very similar search engines. Search techniques for Search All Databases can be used for each database

### **Searching All Databases**

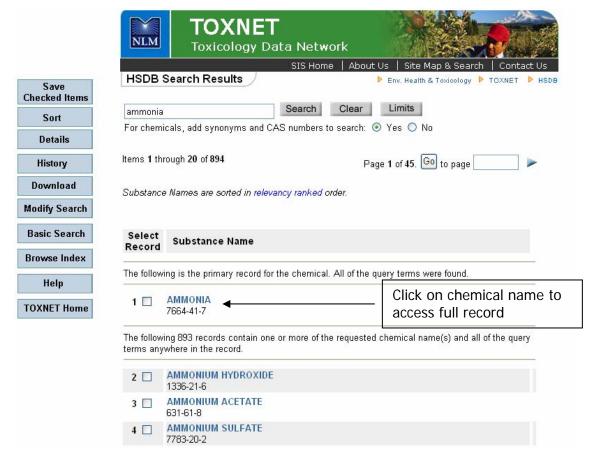
 Search by chemical names, other terms (including multiple terms), and numbers (including CAS numbers)



 Search results display a summary of the number of records retrieved in each database

### **TOXNET Data Files**

Example: HSDB (Hazardous Substances Data Bank)



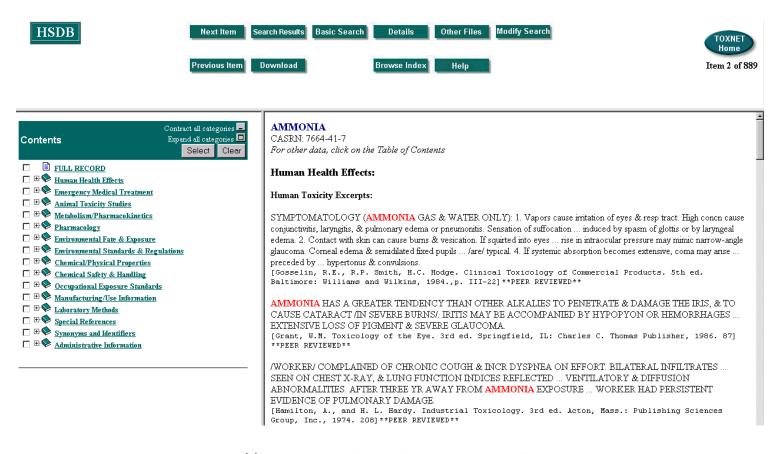
Results display best matches first



- Saved Checked I tems option allows you to display selected records only
  - Check box next to record number(s)
  - Click Saved Checked Items
  - Click **Display Saved Items** to view only the selected records
- Sort allows selected records to be resorted in ascending or descending order. TIP: This is best used with Saved Checked Items
- Details displays the search strategy
- History displays your recent searches
- Download allows some or all of the records retrieved to be downloaded in brief or full format. TIP: This is best used with Saved Checked Items
- Browse Index opens the Browse the Index search screen

### **Full Record Display**

 The Full Record Display for each TOXNET data file has a similar look and navigation



- The search term(s) is highlighted in red in the full record
- Each database has the Table of Contents in the left frame and the full record in the right frame
- The **Table of Contents** includes quick links to the specific fields and categories within the record. Items of note include:
  - Human Health Effects (which is the default display in HSDB)
  - Emergency Medical Treatment
  - Animal Toxicity Studies
  - Environmental Fate and Exposure
  - Manufacturing/Use Information (includes the major uses of the substance and manufacturers)

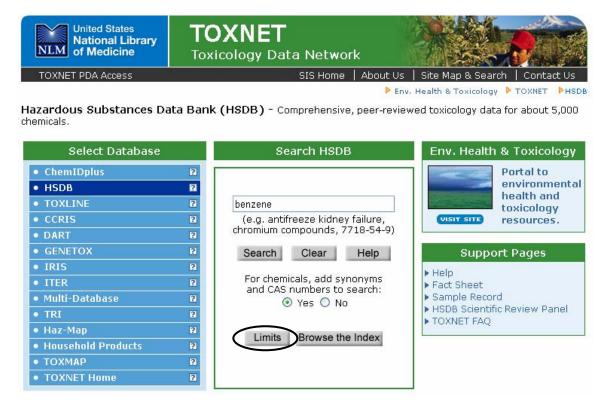
### Moving between Databases

 The Other Files button, located at the top of the results page, allows the search to be conducted in other TOXNET files

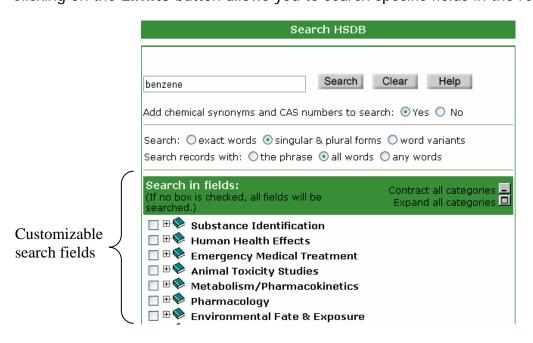


### **Searching Individual Databases**

- Boolean searching using AND, OR, and NOT is available
- Truncation using the asterisk (\*) is allowed at the end of a word and will search any number of characters
- Phrase searching by quotation marks is allowed



Clicking on the Limits button allows you to search specific fields in the record



# **Practice Exercises**

1. Can the ingestion of hydroquinone be fatal?

2. What is sodium benzoate used for?

3. Is lead chromate a carcinogen?

### **TOXNET Literature Files**

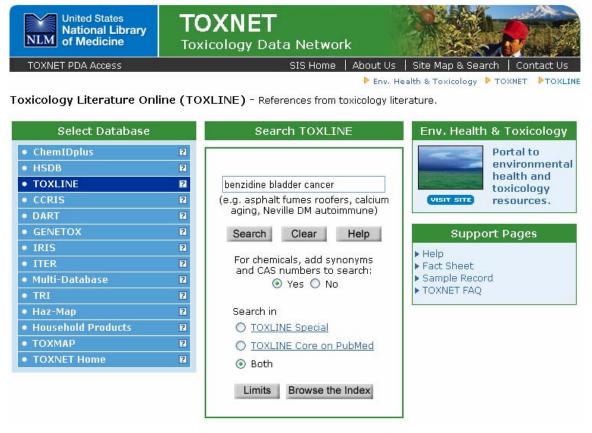
### **TOXLINE (TOXicology Literature onLINE)**

- From NLM
- Bibliographic information on pharmacological, biochemical, physiological, environmental, and toxicological effects of drugs and other chemicals
- Coverage 1950 to present
- Over 3 million citations
- 2 components: TOXLINE core and TOXLINE Special
  - o TOXLINE Core searchable via PubMed (toxicology subset)
    - Standard toxicology journals
  - o TOXLINE Special searchable via TOXNET
    - Special journals, technical reports, research projects, and archival collections

# Developmental and Reproductive Toxicology/Environmental Teratology Information Center (DART/ETIC)

- Managed by NLM and funded by the EPA, the National Institute of Environmental Health Sciences (NIEHS), the National Center for Toxicological Research (NCTR) of the Food and Drug Administration (FDA), and NLM
- Bibliographic information on teratology and other aspects of developmental and reproductive toxicology
- Coverage 1953 to present
- Over 100,000 citations
- 2 components DART Core and DART Special
  - DART Core searchable via TOXNET
    - links to PubMed citations
  - DART Special searchable via TOXNET
    - non-PubMed citations including meeting abstracts, technical reports, and non-MEDLINE journals

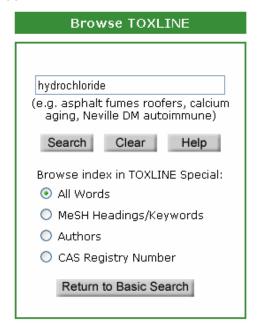
# **Searching TOXLINE**

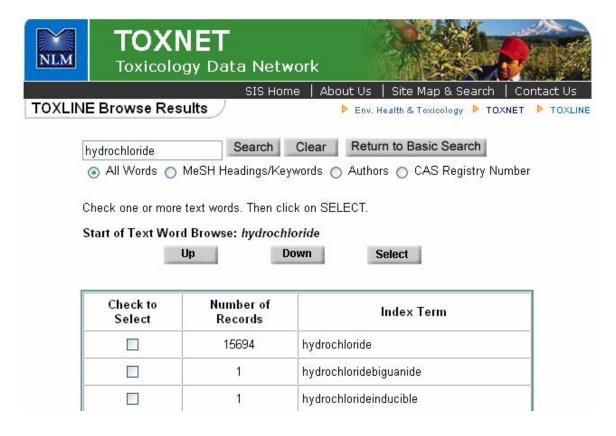


- Default option searches both TOXLINE Special and TOXLINE Core
- Results for TOXLINE Special are displayed within the TOXNET database, results for TOXLINE Core display in PubMed
- Additional search options:
  - Browse the Index
  - Limits Search
- NOTE: TOXLINE and DART employ very similar search engines. All search techniques for TOXLINE can be used for DART

### **Browsing TOXLINE**

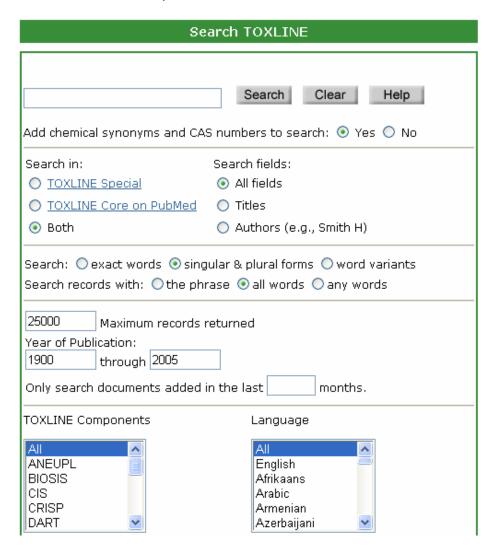
 Browse the Index allows browsing by terms, MeSH headings or Keywords, Authors or CAS number





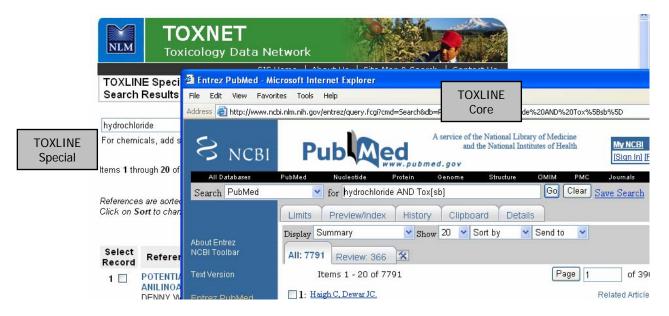
### **Using Limits**

- Search by chemical names, other terms (including multiple terms), and numbers (including CAS numbers)
- Click on the Limits button to limit your search. Type of Limits include
  - o Title or Author fields
  - Searching exact words or variants
  - o Maximum number of results retrieved
  - Year of publication
  - Search by languages
  - TOXLINE components



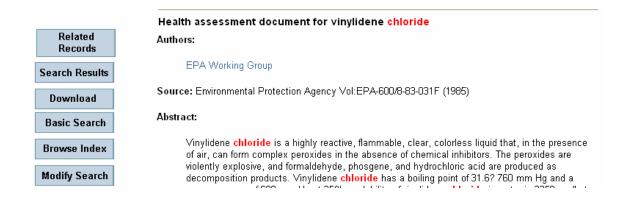
### **TOXLINE Results**

- Search results for TOXLINE Core are displayed within the PubMed screen
- Search results for TOXLINE Special are displayed within TOXLINE



### Full Record Display in TOXLINE Special

- Full records include the citation plus abstract
- Search term(s) are highlighted in red
- Related Records searches for results similar to the selected record



# **Practice Exercise**

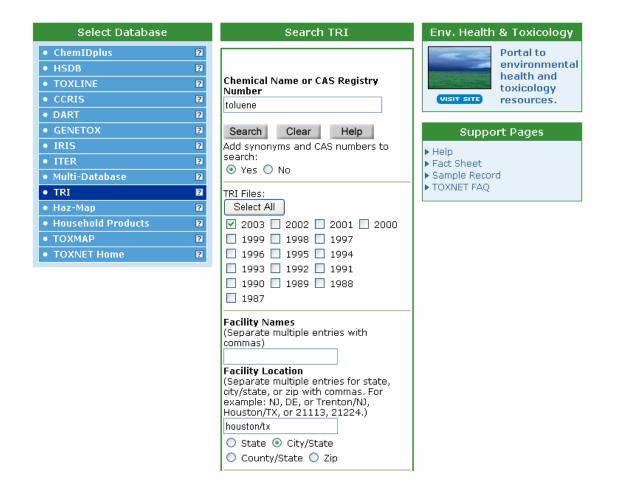
1. Has imipramine in the treatment of enuresis ever been found to be poisonous?

2. What is the effect of ciguatera poisoning on a fetus?

# **TOXNET Specialty Files**

### **Toxics Release Inventory (TRI)**

- Based on data submitted to the EPA from industrial facilities in U.S.
- Describe the releases of toxic chemicals into the environment annually (1987 2003)
- Data includes names and addresses of facilities, the amounts of toxic chemicals released to the air, water, land, or transfer to waste sites
- About 650 chemicals and chemical categories

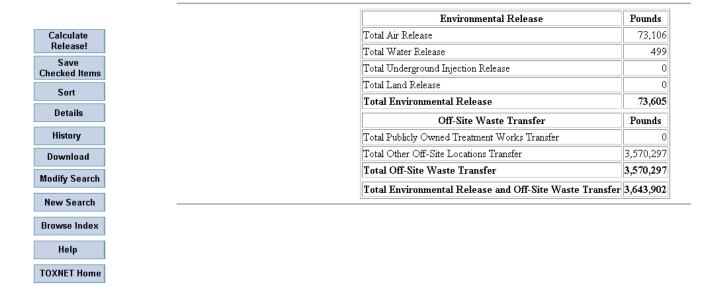


- Results display in brief format with the facilities and chemical list
- The Map it with TOXMAP button displays the results in TOXMAP



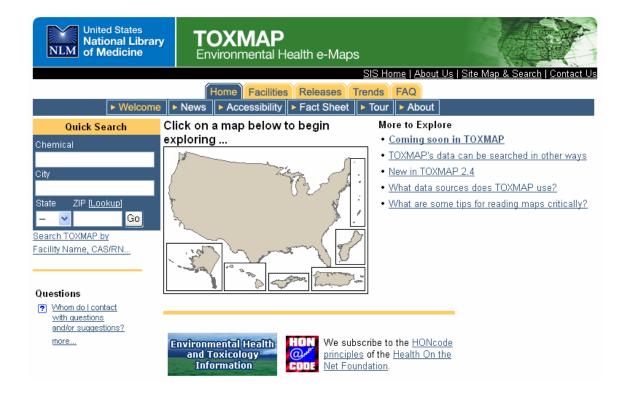
 To find the total release of the chemical by facility, select the record and click on Calculate Release! Results summarize the total amount released

### TRI Calculation Results

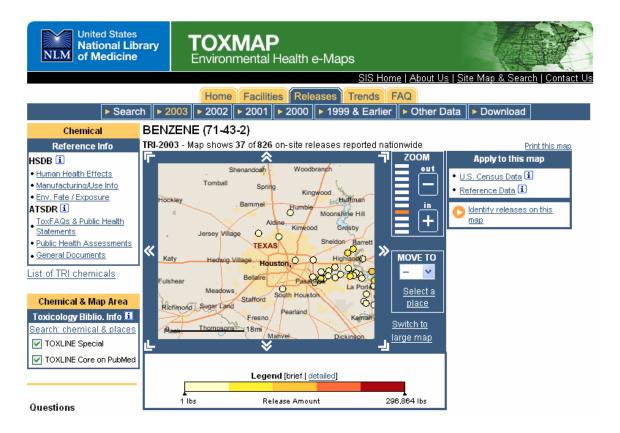


### **TOXMAP**

- From NLM
- Maps TRI data
- Displays air, water, and land releases as reported by US industrial facilities
- Search by chemical name, facility name or location



- Display facilities in a location, chemicals released from a location or facility
- Trend a chemical released by facility or location



- Links to HSDB and ATSDR information as well as TOXLINE searches
- Can include census and reference data on map

### Haz-Map

- From NLM
- Occupational toxicology database addressing the health effects of exposure to chemicals an biological substances in the workplace
- Links jobs and hazardous tasks with occupational diseases and their symptoms
- Contains approximately 1,000 chemicals and 180 occupational diseases



#### Household Products Database

- From NLM
- Information on potential health effects of chemicals or substances contained in more than 5,000 common household products
- Users can browse by a product category such as 'Pesticides' or by alphabetical listing of brand names
- Products can also be searched by type, manufacturer, product ingredient/chemical name and by health effects
- Record for each product shows ingredients as reported in the manufacturer's Material Safety Data Sheets (MSDS)
- Links to TOXNET, PubMed and other NLM databases

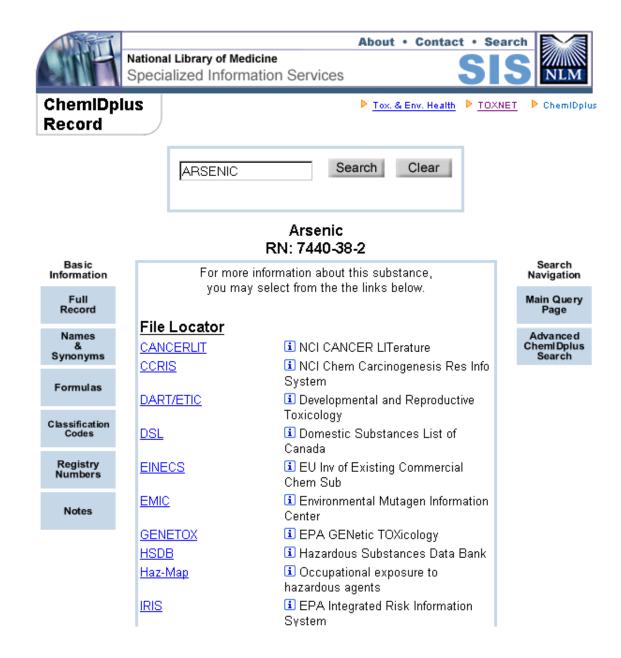


### **ChemIDplus**

- From NLM
- Structure and name file used for the identification of chemical substances
- Contains over 379,000 chemical records
- Structural Data for over 257,000 records
- Search options include Basic and Advanced Search

### **Basic Search**

Yields a list of results from different sources



- The Basic Information buttons on the left of the results allows you to access the ChemID*plus* Full Record, or a specific portion of the record, such as Names & Synonyms, Formulas, Classification Codes, Registry Numbers, and Notes
- The Search Navigation button on the right allow you to go back to a basic search (Main Query Page) or to the advanced search (Advanced ChemI Dplus Search)
- The middle of the results pages lists the **Locators** where further information on the chemical is found
- The **File Locators** point to NLM associated databases

File Locator	
CANCERLIT	i NCI CANCER LITerature
CCRIS	i NCI Chem Carcinogenesis Res Info System
DART/ETIC	Developmental and Reproductive Toxicology
DSL	i Domestic Substances List of Canada
<u>EINECS</u>	i EU Inv of Existing Commercial Chem Sub
EMIC	i Environmental Mutagen Information Center
<u>GENETOX</u>	i EPA GENetic TOXicology
HSDB	i Hazardous Substances Data Bank
<u>Haz-Map</u>	Occupational exposure to hazardous agents
IRIS	i EPA Integrated Risk Information System
MEDLINE	■ MEDical literature onLINE
MESH .	i Medical Subject Headings File
MESH HEADING	i Medical Subject Headings
RTECS	Registry of Toxic Effects of Chemical Substances
TOXLINE Core	INLM TOXLINE Core from MEDLINE
TOXLINE Special	i NLM TOXLINE Special on TOXNET
TRI2000	i EPA Toxics Release Inventory 2000
TRI2001	i EPA Toxics Release Inventory 2001
<u>TRI95</u>	i EPA Toxics Release Inventory 1995

- Internet Locators link to web resources containing biomedical data
   Superlist Locators link to regulatory and scientific lists

Internet Locator	
ATSDR PHSs	ATSDR Public Health Statements
ATSDR TOXFAQS	i ATSDR ToxFAQS
ATSDR Tox Profiles	ATSDR Toxicological Profiles
EPA CRS	<b>i</b> EPA Substance Registry System
EPA Envirofacts	i EPA Master Chemical Integrator
NIOSH ICSC	i NIOSH International Chemical Safety Cards
NIOSH Pocket Guide	i NIOSH Pocket Guide to Chemical Hazards
NIST WebBook	■ NIST Chemistry WebBook
NJ-HSFS	i New Jersey Hazardous Substance Fact Sheets
Superlist Locator	
DOT	i DOT Hazardous Materials
IARC	i International Agency for Research on Cancer
MA	i Massachusetts Right-to-know Substances
<u>MI</u>	🗓 Michigan Critical Materials Register
NJ	New Jersey Right-to-know Substances
PA	i Pennsylvania Right-to-know Substances
PEL	i OSHA Toxic and Hazardous Substances
PELS	i OSHA Toxic and Hazardous Substances, 1989
REL	i NIOSH Recommended Exposure Limits
<u>RQ</u>	i CERCLA Reportable Quantities
<u>S110</u>	i ATSDR Priority List of hazardous substances
TLV	i ACGIH Threshold Limit Values
<u>TRI</u>	■ EPA Toxics Release Inventory
<u>WHMI</u>	i Workplace Hazardous Materials Information

- The  ${\bf i}$  button gives you more information about the Locator
- To view the results in any Locator, click on its name

# **Practice Exercises**

1. Find the Mercury releases in Houston, Texas. Which facility has the highest amount of releases?

2. What are the acute health effects associated with Victor Roach Killing Powder?